### Japanese Utility Model Laid-Open No. 56-130832

(4,000 yen)

### Request for Utility Model Registration

March 4, 1980

To: Yoshio KAWAHARA, Commissioner of Patent Office

1. Title of the Device:

Heat-resistant Board

2. Creator of Device:

Residence: 2-5-6, Shinkanaoka-cho, Sakai-shi, Osaka

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3. Applicant of Utility Model Registration:

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Name: Nippon Steel Chemical Co., Ltd. (644)

Representative: Taiso IMAI

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- 4. List of Attached Documents:
  - (1) Specification
  - (2) Drawing
  - (3) Copy of Request

### **Specification**

#### 1. Title of the Device:

Heat-resistant Board

### 2. Claims of Utility Model:

- 1. A heat-resistant board, wherein a base is integral with a sprayed heat-resistant inorganic material via an adhesive layer.
- 2. The heat-resistant board according to claim 1, wherein the sprayed heat-resistant inorganic material layer consists essentially of an inorganic fiber and an inorganic binder.
- 3. The heat-resistant board according to claim 2, wherein the inorganic fiber is rock wool and the inorganic binder is cement.
- 4. The heat-resistant board according to claim 1, wherein the base is selected from the group consisting of a woody board, a plastic board, a foamed plastic board, a cement board, a gypsum board, a fiber-reinforced cement board, a calcium silicate board, and a wood wool board.
- 5. The heat-resistant board according to claim 1, wherein the sprayed heat-resistant inorganic material layer is formed by spraying, from 1000 mm or more distance, a material comprising 30 to 70 % of rock wool, 0 to 20 % of vermiculite, 20 to 40 % of portland cement or blast furnace cement, and 0 to 20 % of gypsum, together with water and air.

### 3. Detailed Description of the Device:

The present device relates to a heat-resistant board having light weight, acoustic absorption, incombustibility, and other features, wherein a base is integral with a sprayed heat-resistant inorganic material via an adhesive layer.

The present device is hereinafter described by one embodiment shown in a figure. In the figure, there are a base 1, an adhesive layer 2, and a sprayed heat-resistant material layer 3.

The base 1 can be made of any material such as wood, synthetic resin, metal, ceramic, or concrete. When importance is placed on lightness, wood, synthetic resin or the like is preferred. When importance is placed on fire resistance, an inorganic fiber board, fiber-reinforced concrete or the like is preferred. The base 1 can have any shape, but use of a plate-shape material allows the sprayed heat-resistant material layer to have a uniform thickness. Therefore, preferred examples of the base include a woody board, a plastic board, a foamed plastic board, a cement board, a gypsum board, a fiber-reinforced cement board, a calcium silicate board, and a wood wool board.

An adhesive to be used for the adhesive layer 2 can be selected from any of organic adhesives such as synthetic resin adhesives or any of inorganic adhesives such as alkaline silicate in consideration of affinity with the base. When the base is a woody board, a synthetic resin board, or a concrete board, preferred is vinyl acetate adhesive, urea melamine cocondensation resin adhesive or the like. When the base is a combustible material such as a woody board, a synthetic resin or the like, a fire retardant such as phosphate fire retardant is preferably added to the adhesive. The applied amount of the adhesive varies depending upon the kind of the adhesive, but 5 to 100 g/m² of the adhesive is typically applied.

The sprayed heat-resistant material layer 3 comprises inorganic fibers and an inorganic binder as main components, and the layer may additionally contain aggregates, and small amounts of a tackiness agent, a coloring agent, an organic adhesive and the like. As the inorganic fiber, rock wool, glass wool, asbestos, and the like can be used, but rock wool is better in view of performance. As the inorganic binder, gypsum, silicates, lime, and the like can be used in addition to cement, but a cement such as blast furnace cement or portland cement is preferred. In addition, as the aggregates, bentonite, vermiculite, pearlite, inorganic powder, etc. can be added if

necessary. Use of vermiculite, pearlite, etc. improves lightness. Further, a pressure-sensitive adhesive such as carboxymethyl cellulose, a coloring agent, a paste, and an organic adhesive such as poly(vinyl acetate) can be optionally added in a small amount. The ratio of the inorganic fiber to the inorganic binder is preferably 1:0.5 - 2.

One preferred example is a material, for example, comprising 30 to 70 % of rock wool, 0 to 20 % of vermiculite, 20 to 40 % of portland cement or blast furnace cement, and 0 to 20 % of gypsum.

The sprayed heat-resistant material layer 3 is provided by spraying a material having the above composition toward the base 1 provided with the adhesive layer 2. As a spraying method, the following method are known: a wet method wherein a slurry of materials such as inorganic fiber, an inorganic binder, etc. is sprayed together with air; a dry method wherein dry materials are sprayed with water and air; and a semi-wet method wherein a slurry containing one of the inorganic fiber and the inorganic binder and the other as it is dry are sprayed with air. However, the dry and semi-wet methods using a slurry of the inorganic fiber are better in that the thickness and density of the sprayed heat-resistant material layer are made as even as possible. In particular, a board having the sprayed heat-resistant material layer 3, 10 mm or less in thickness, preferably about 5 mm, is excellent in view of handling operation and other points. However, since it is difficult to spray them uniformly so as to have such thickness, it is desirable to spray them according to the following method. That is, while a spray gun is held at a height of 1000 mm or more from the base 1, spraying is carried out just like falling snow. Thereafter, the sprayed layer is pressed with a roller or a trowel so as to finally have a predetermined thickness. Then, the sprayed heat-resistant material layer 3 having a uniform density and a smooth surface can be obtained. It should be noted that a common dry spraying machine can be used in this device.

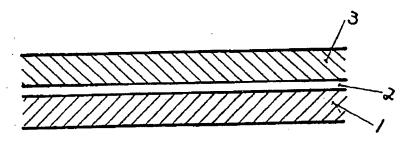
The heat-resistant board of the present device may be provided or coated with a thin film on its surface for beautiful appearance and dust proof. Further, an adhesive layer may be provided on the back surface of the base or reinforced screw holes, etc.

may be provided at required locations of the base for installing the heat-resistant board firmly and easily.

### 4. Brief Description of Drawing:

The figure is a cross-sectional view of a heat-resistant board of the present device. In the figure, there are a base 1, an adhesive layer 2, and a sprayed heat-resistant material layer 3.

Applicant of Utility Model Registration: Nippon Steel Chemical Co., Ltd.



### 130832

Reference 2

Figure

1: Base (such as woody board, plastic board, foamed plastic board, cement board,

gypsum board, fiber reinforced cement board, calcium silicate board, etc)

32 Spray Heat resistant Material Layer (which formulated inorganic fiber and inorganic binder material such as cement)

Adhesive Layer (used such as polyvinyl acetate adhesive)

突用新窓門録出顧人



正





(4000A)

実 用 新 案 登 録 願



昭和55年3月4日

特許庁長官 川 原 能 雄 殿

/. 考案の名称

シャッツ 断熱板

2 考 案 者

は 対 大阪府堺市新金岡町 2 一 5 ー 6

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3. 実用新案登録出願人

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名 称 (664) 新日本製鉄化学工業株式会社

代表者 今 井 大 宗

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(2) 図

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(3) 願書副本

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明 細 書

- 考案の名称 新 込 次
- 2. 実用新案登録請求の範囲
  - 1. 基材と無機吹付断熱材層とを接着削層を介して一体にしてなる断熱板。
  - 2. 無機吹付断熱材層が、無機繊維と無機結合 材から主としてなるものである実用新案登録 請求の範囲第1項記載の断熱板。
  - 8. 無機繊維がロックウールであり、無機結合 材がセメントである実用新案登録請求の範囲 第2項記載の断熱板。
  - 4. 基材が、木板、プラスチック板、発泡プラスチック板、セメント板、石膏板、繊維強化セメント板、硅酸カルシウム板、木毛板からなる群から選ばれたものである実用新楽登録請求の範囲第1項記載の断熱板。
  - 無機 吹付断熱材層がロックウール30~
     70%、ひる石0~20%、ポルトランドセ



الممنشط

メント又は高炉セメント20~40%、石膏 0~20%からなる材料を水および空気と共 に、1000mm以上離れた箇所から吹付けて なるものである実用新菜登録請求の範囲第1 項記載の断熱板。

### 3. 考案の詳細な説明

本考案は、基材と無機吹付断熱材層を接着削層を介して一体にしてなる軽量、吸音、不然その他の特長を育する断熱板に関するものである。本考案を以下図面に示す一実施別により説明する。なお、図中1は基材、2は接着剤層、3は吹付断熱材層である。

基材1の材質は、木、合成樹脂、金属、セラミックス、コンクリート等任意であるが、軽量性で重点を置く場合は木、合成樹脂等が好ましく耐火性に重点を置く場合は無機繊維板、繊維強化コンクリート等が好ましか。基材1の形状は任意であるが、板状物を使用すると吹付所熱材を均一にすることができる。したがって基材としては、木板、プラスチック板、発

泡プラスチック板、セメント板、石膏板、繊維 強化セメント板、硅酸カルシウム板、木毛板等 が好適である。

吹付断熱材層 3 は、無機繊維、無機結合材を 主材とするものであって、その他骨材、少量の 粘着剤、着色剤、有機接着剤等を含有すること ができる。無機繊維としては、ロックウール、 クラスウール、アスペスト等が使用できるが、



別えば、ロックウール30~70%、ひる石0~20%、ポルトランドセメント又は高炉セメント20~40%、石質0~30%の割合とした材料が好適なものの一例である。

0.5~2の範囲とすることが好ましい。

吹付断熱材層3を設けるに当っては、上記のような組成の材料を接着剤層2を設けた基材1 に向けて吹き付けることによって行う。吹付法

としては、無機繊維、無機結合削等の材料をス ラリーとして空気と共に吹き付ける湿式法、材 料を乾いたまま水と空気と共に吹き付ける乾式 法、無機繊維又は無機結合材のいずれかをスラ リーとし他は乾いたまま空気と共に吹き付ける 半湿式法が知られているが、乾式法かよび無機 繊維をスラリーとする半湿式法が吹付断熱材層 の厚みと密度を可及的均一にする点で優れる。 特に、吹付断熱材層3の厚みを10㎜以下好ま しくは5皿前後としたものは取扱いその他の点 で愛れるが、このように薄いものは均一に吹き 付けることが困難であるので、次のような方法 で吹き付けることが望ましい。すなわち、吹き 付けガンを基材1から1000m以上の高さに保 持して雪を降らせるように吹付け、その後ロー ル又はコテ押えして所定の厚みに仕上げるよう にすると、密度が均一で且つ表面が平滑を吹付 断熱材層3を得ることができる。なお、吹付渡 は通常の乾式吹付機を使用することができる。

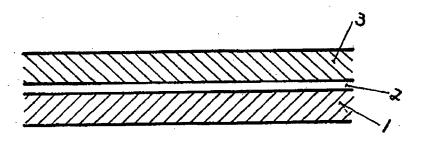


その表面に薄い被膜を設けたり、塗装することがある。また、断熱板を強固且つ容易に取り付けるために基材の裏面に接着剤層を設けたり、 基材の所要簡所に補強されたビス穴等を設ける ことがある。

4. 図面の簡単な説明

図面は、本考系の断熱板の断面図であり、図中1は基材、2は接着削層、3は吹付断熱材層である。

実用新案登録出題人 新日本製鉄化学工業株式会社



### 130832

### Reference 2

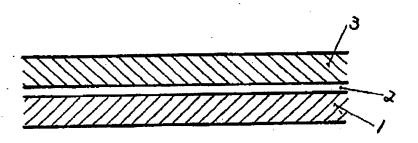
Figure

1: Base (such as woody board, plastic board, foamed plastic board, cement board, gypsum board, fiber-reinforced cement board, calcium silicate board, etc)

2: Spray Heat-resistant Material Layer (which formulated inorganic fiber and inorganic binder material such as cement)

3: Adhesive Layer (used such as polyvinyl-acetate adhesive)





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1: Base (such as woody board, plastic board, foamed plastic board, cement board,

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3 2. Spray Heat-resistant Material Layer (which formulated inorganic fiber and inorganic binder material such as cement)

28: Adhesive Layer (used such as polyvinyl-acetate adhesive)

実用新索門録出顧人

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